

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (currently amended) A cathode composition for a lithium-ion battery having the formula  $\text{Li}[\text{M}_{(1-x)}^1\text{Mn}_x]\text{O}_2$  where  $0 < x < 1$  (a)  $0 < x < 0.5$  or (b)  $0.5 < x < 1$ , and  $\text{M}^1$  represents one or more metal elements, with the proviso that  $\text{M}^1$  is a metal element other than chromium, and when  $\text{M}^1$  includes nickel, cobalt, or a combination thereof, all of the nickel has an oxidation state of +2 in air, all of the cobalt has an oxidation state of +3 in air, and all of the manganese has an oxidation state of +4 in air,

said composition characterized as being in the form of a single phase having an O3 crystal structure that does not undergo a phase transformation to a spinel crystal structure when incorporated in a lithium-ion battery and cycled for 100 full charge-discharge cycles at 30°C and a final capacity of 130 mAh/g using a discharge current of 30 mA/g.

2. (original) A cathode composition according to claim 1 wherein  $\text{M}^1$  is selected from the group consisting of Ni, Co, Fe, Cu, Li, Zn, V, and combinations thereof.

3. (currently amended) A cathode composition according to claim 1 wherein  $x = (2-y)/3$  and  $\text{M}_{(1-x)}^1$  has the formula  $\text{Li}_{(1-2y)/3}\text{M}_y^2$ , where  $0 < y < 0.5$  and  $\text{M}^2$  represents one or more metal elements, with the proviso that  $\text{M}^2$  is a metal element other than chromium, and when  $\text{M}^2$  includes nickel, cobalt, or a combination thereof, all of the nickel has an oxidation state of +2 in air, all of the cobalt has an oxidation state of +3 in air, and all of the manganese has an oxidation state of +4 in air,

said cathode composition having the formula  $\text{Li}[\text{Li}_{(1-2y)/3}\text{M}_y^2\text{Mn}_{(2-y)/3}]\text{O}_2$ .

4. (original) A cathode composition according to claim 3 wherein  $0.083 < y < 0.5$ .

5. (original) A cathode composition according to claim 3 wherein  $0.167 < y < 0.5$ .

6. (original) A cathode composition according to claim 3 wherein  $M^2$  is a single metal element.

7. (original) A cathode composition according to claim 6 wherein  $M^2$  is Ni.

8. (currently amended) A cathode composition according to claim 1 wherein  $x = (2-2y)/3$  and  $M^{1(1-x)}$  has the formula  $Li_{(1-y)/3}M^3_y$ , where  $0 < y < 0.5$  and  $M^3$  represents one or more metal elements, with the proviso that  $M^3$  is a metal element other than chromium, and when  $M^3$  includes nickel, cobalt, or a combination thereof, all of the nickel has an oxidation state of +2 in air, all of the cobalt has an oxidation state of +3 in air, and all of the manganese has an oxidation state of +4 in air,

said cathode composition having the formula  $Li[Li_{(1-y)/3}M^3_yMn_{(2-2y)/3}]O_2$ .

9. (original) A cathode composition according to claim 8 wherein  $0.083 < y < 0.5$ .

10. (original) A cathode composition according to claim 8 wherein  $0.167 < y < 0.5$ .

11. (original) A cathode composition according to claim 8 wherein  $M^3$  is a single metal element.

12. (original) A cathode composition according to claim 11 wherein  $M^3$  is Co.

13. (currently amended) A cathode composition according to claim 1 wherein  $x = y$  and  $M^{1(1-x)}$  has the formula  $M^4_yM^5_{1-2y}$ , where  $0 < y < 0.5$ ,  $M^4$  is a metal element other than chromium, and  $M^5$  is a metal element other than chromium that is different from  $M^4$ , and when  $M^4$ ,  $M^5$ , or both includes nickel, cobalt, or a combination thereof, all of the nickel has an oxidation state of +2 in air, all of the cobalt has an oxidation state of +3 in air, and all of the manganese has an oxidation state of +4 in air,

said cathode composition-having the formula  $Li[M^4_yM^5_{1-2y}Mn_y]O_2$ .

14. (original) A cathode composition according to claim 13 wherein  $0.083 < y < 0.5$ .

15. (original) A cathode composition according to claim 13 wherein  $0.167 < y < 0.5$ .

16. (original) A cathode composition according to claim 13 wherein  $M^4$  is Ni.

17. (original) A cathode composition according to claim 13 wherein  $M^5$  is Co.

18. (original) A cathode composition according to claim 13 wherein  $M^4$  is Ni and  $M^5$  is Co.

19. (currently amended) A lithium-ion battery comprising:

- (a) an anode;
- (b) a cathode according to claims 1, 3, 8, or 13; and
- (c) an electrolyte separating said anode and said cathode;

~~—said cathode comprising a composition having the formula  $\text{Li}[\text{M}^{+}_{(1-x)}\text{Mn}_x]\text{O}_2$  where  $0 < x < 1$  and  $\text{M}^{+}$  represents one or more metal elements, with the proviso that  $\text{M}^{+}$  is a metal element other than chromium;~~

~~said composition characterized as being in the form of a single phase having an O3 crystal structure that does not undergo a phase transformation to a spinel crystal structure when said lithium ion battery is cycled for 100 full charge-discharge cycles at 30°C and a final capacity of 130 mAh/g using a discharge current of 30 mA/g.~~